University of Nevada, Reno

Nevada Center for Applied Research (NCAR)

Bioscience Entrepreneurial Laboratory

High Performance Computing Facility

Evolutionary Computing System Lab

Mick Hitchcock Nevada Proteomics Center

Autonomous Car Program

Nevada Terawatt Facility

Quarterly Progress Report

Reporting Period: April 1st to June 30th, 2016

July 2016

Table of Contents

Project Purpose

The Nevada Center for Applied Research is a stand-alone, fully-functional applied research and development technology center that serves to enhance the global competitiveness of Nevada industry by leveraging the physical and intellectual assets of the University of Nevada, Reno.

NCAR's mission is to create a professional, flexible, sustainable, market-responsive technology innovation center that serves to stimulate regional innovation-based economic development by aligning the needs of industry, startup companies, researchers and entrepreneurs with resources at University of Nevada, Reno. This is achieved by providing industries with a central and public access point to utilize the broad range of technical services, intellectual capital, testing and research capabilities, advanced tools and methodologies available at NCAR's Shared Research Facilities that otherwise would be cost-prohibitive for startups and not cost-effective for established companies. As a one-stop shop for applied research, NCAR mission is to help industries:

- Establish a collaborative relationship with academia promoting open innovation research programs and scientific studies to address real-world problems.
- Facilitate access to cutting-edge Shared Research Laboratories and sophisticated instrumentation and equipment.
- Build an interdisciplinary team of faculty, scientists, postdoctoral students and grad students to work on ongoing projects, stand-alone one-off projects, or new-complex developments.
- Provide access to an entrepreneurs' support network that includes incubation and business mentoring from experienced entrepreneurs and executives.
- Provide reduced cost co-working space available to the University community and local startups.

NCAR's specific goals are to foster industry growth and new jobs creation; strengthen existing companies in advanced manufacturing and other key sectors and support the creation of industry clusters that leverage the competitive advantages of Nevada.

NCAR is closely aligned with strategic university programs that are designed to provide value to industry. Some of these programs include: The Autonomous Car program, The Terawatt Facility, Material and Chemical Characterization Equipment, BioSciences Entrepreneurial Laboratory, High Performance Computing Facility, and The Nevada Advanced Autonomous System Innovation Center.

In an attempt to bridge the industrial community and the University, NCAR utilizes space both on campus (Research Centers, Cores and Applied Research Facility) and in the new state-of-the-art University of Nevada, Reno Innevation Center Powered by Switch in MidTown, close to the entrepreneurial epicenter of Reno.

Section I: Proposal Progress

During this reporting quarter, the Nevada Center for Applied Research (NCAR) has made progress toward meeting proposed metrics. Major accomplishments for the current reporting period include:

1. Accomplishment

Accomplishment 1 - NCAR Management - Defining NCAR's Strategic Plans and Goals

We have completed most of the specific tasks and procedures designed to facilitate NCAR's operation and move toward an efficient and sustainable model:

i. We executed some of the fee-for-service agreements drafted and approved during the last quarter, addressing all standard issues that were of major concern for Industry and the University. A memorandum was created to a) clearly identify and differentiate fee-for-services from sponsored research, b) make clear that UNR labs will not compete with private sector service providers, c) issues related to the involvement of students and other trainees in fee for service work, and d) the F&A Rate for all fee for service contracts. This memorandum will be distributed to any Shared Research Facility or Core Lab that is engaged in a fee-for-service contract through NCAR.

ii. Face-to-face meetings with personnel at all SRF/CL within UNR continued during this quarter to keep updating the inventory of all major equipment and explain the NCAR concept to lab managers and administrators. These meetings were less frequent that the meetings during Q1 2016 due to other projects taking priority and also lack of lab personnel during the summer break. We anticipate that before the end of Q4 2016, we will complete this process.

iii. Face-to-face meetings with with faculty leads and professors from different colleges and schools within the University also continued during this quarter. During this quarter, the focus for these meeting was on faculty members that can have a direct involvement on Synchronized and Sustainable Mobility.

Accomplishment 2 - NCAR Management - Bioscience Entrepreneurial Lab

The Biosciences Entrepreneurial Laboratory was successfully completed and opened with several local press releases to provide information to campus and the local public about the newly developed space. Proxy readers were installed at the BEL entrance and the Applied Research Facility entrance to facilitate access to new tenants. The lab was also inspected and cleared by EH&S for occupancy and waste containers were delivered for both chemical and biological waste. The BEL office has been created and is fully functional with a new PC and printer. A contract was signed with first tenant company, EscaZyme Biochemical, and the company is currently using the facility. All chemicals used by this company are being checked in for EH&S tracking purposes. All necessary procedures and paperwork were developed to satisfy EH&S and OSHA guidelines. Standard operating procedures are being developed to streamline the process for companies and ensure NCAR has covered all its bases. A price list is in development to charge back any consumable usage to tenants and a method for billing/invoicing, ordering, and equipment reservations for the BEL is being created. This will

be a temporary procedure to be used until the BEL is added to the iLab system in a subsequent wave (see accomplishments for iLab). Currently we are discussing access to the lab with a new company that is interested in using the facility.

Accomplishment 3 - NCAR Management – Laboratory Information Management System (LIMS) implementation

The iLab system is ready to launch and should be live the second week of July pending successful integrations with the credit card gateway and UNR net ID's. Currently, a set of material is being produced to alert current University users and external clients of the Proteomics Center and the Innevation Center migration to the iLab system. This include the ability to access training for using the iLab system. NCAR was recently approached by NV IDeA Network of Biomedical Research Excellence (INBRE) to collaborate on a grant proposal to centralize their core administration using the iLab system to help ensure future success of their core labs that fall under the Shared Research Facilities umbrella. The next wave of labs to be added to the iLab system will decided during Q3.

Accomplishment 4 – High Performance Computing Facility (HPCF)

A High Performance Computing (HPC) plan for UNR has been completed and approved. Implementation will be the next phase. A position was created and approved and funding secured for a lead HPC administrator. Recruitment will begin in July, 2016. Discussions are ongoing with Switch about housing the UNR HPC cluster at the new Switch Supernap located in the Tahoe-Reno Industrial Campus in Northern Nevada.

Accomplishment 5 – Evolutionary Computing System Lab (ECSL) (Dr. Siming Liu, Prof. Sushil Luis)

Dr. Siming Liu won two courses teaching position in the next two semesters with the grant amount $7934*4=$31,736 (CS105 Introduction of Computing in Fall 2016 and Spring 2017 and CPE201 Digital Design in Fall 2016 and Spring 2017). The center continues working on the Traffic Signal Optimization project with Dr. Tian. The system was debugged and enhanced multiple subsystems display on the Google Map view. Enhancements were also made in the Time-Space Diagram to display multiple subsystems and new feature on displaying a virtual trajectory on virtual controller interface device were implemented.

Accomplishment 6 – The Mick Hitchcok Nevada Proteomic Center (Dr. David Quilici)

The Nevada Proteomic Center continue developing the implemented cutting edge approach for proteome quantitation. This approach was developed at Harvard University and the NPC staff was trained at Harvard Medical center on these methodologies and implemented them at the Nevada proteomic center for NSHE researchers.
The Nevada Proteomic Center also continue offering free monthly workshops open to all NSHE researchers. The workshops are computer based and for those individuals that are either currently performing proteomic research or interested in the field proteomics. This offers proteomic researchers an opportunity to have a hands-on experience to maximize their proteomic research.

The Nevada Proteomic Center has provided services to 12 NSHE researchers and 3 external academic institutions. The NSHE researchers span two University's and six departments. Services have also been provided to proteomic researchers at the University of Alaska, Fairbanks and the University of Utah.
The center is collaborating with NCAR and the Bioinformatics core to establish a pipeline in an effort to provide the highest quality data to proteomic researchers.
Attended the American Society for Mass Spectrometry conference and presented a poster.
Provided letters of support for extramural funding to Dr. Vincent Lombardi (WPI) and Dr. Jennifer Curtis (NMSU).

Accomplishment 7 – Autonomous Car Program (Prof. Raul Rojas)

NCAR in collaboration with GOED have developed strategic partnerships with the Regional Transportation Commission (RTC) and the Fraunhofer Institute IVI. The goal is to establish *Living Laboratories* to allow the testing of synchronized mobility technologies in complex urban environments. This real life environment would provide the capability for industry, academia and applied research institutions to research, commercialize, develop and test complete ranges of new mobility technologies required to succeed in this fast emerging new market. For this project NCAR have engaged a multi-disciplinary, multi-departmental group of UNR researchers and they are responding to the proposal diligently. We have also developed a 30-page White Paper (available upon request) describing the project and a 4-page summary to approach industry and key stakeholders. NCAR would be the nexus between strategic governance, Living Lab activities (e.g., tests, trials, methods and tools) and citizens and industrial partners (performers of the Living Lab activities). NCAR will be also the link to the actual production and results; a process that starts with a concept design, follows with a prototype development and ends with a final system solution and commercialization.

Accomplishment 8 – Nevada Terawatt Facility (Dr. Aaron Covington)

NTF/NSTec Laser Plasma Diagnostics Development for the Dense Plasma Focus. The Postdoctoral research fellow (Dr. Austin Anderson) continued working full time on this project. Dr. Anderson helped field laser diagnostics similar to those that will be used at DPF on NTF campaigns during April-May, 2016. These experiments showed the operational feasibility of these laser diagnostic systems.
A Mach-Zender interferometer was used to capture pinch images in conditions similar to those expected in DPF experiments. Data obtained from these measurements was analyzed and will be used to determine critical parameters such as the plume implosion velocity and density profile. A new automated data analysis program is also being developed to help expedite the analysis of laser diagnostic images at NTF and DPF.
Dr. Ivanov has completed the design of all optical systems that will be used at the DPF. He has also worked closely with technical staff members at NSTec to ensure that the laser system is installed with proper infrastructure and safety systems. Drs. Ivanov and Covington have also worked with NSTec engineers to develop new viewports into the DPF that will allow for lasers and other probing optical diagnostics to be used in a much wider variety of experiments.
The laser system has been delivered to the NSTec NLV site and preliminary tests of the system have been completed. In addition, Drs. Covington, Darling and Anderson have started taking required safety training that will be needed to work in the NSTec DPF facility.

Development of Spectroscopic Plasma Diagnostics for Measurement of Electromagnetic Fields. The Mr. Eric Dutra fielded a two-week duration Zebra Z-pinch plus Leopard laser campaign for this project in May 2016. This experimental campaign was fielded in collaboration with Drs. Aaron Covington, Tim Darling, Piotr Wiewior and Austin Anderson. Eric's fellow graduate students Alex Angermeier and Jeremy Iratcabal also participated. Multi-axis spectroscopic data was collected from laser ablated aluminum targets that were pinched in the Z-pinch. New, state-of-the-art optical spectrometers purchased for this project were delivered to NTF, calibrated and installed on the experimental floor along with relay optical systems. Once the light had been dispersed by the spectrometers, the temporal evolution of the optical spectra for both axes were collected using NSTec streak cameras. In addition, NSTec provided additional access to a state-of-the-art 16-channel framing camera for the duration of the experiments, which allowed movies of the pinch implosions to be recorded.
Computational efforts were also carried out in support of experiments and spectroscopic data collected during experiments was analyzed. Dr. Roberto Mancini (UNR Physics Department) gave two special seminars to faculty and students describing the use of Spec3D, the LANL Cowan Code in conjunction with his custom plasma spectroscopy and radiation transport code and made his source code available to the project. This code, when used in conjunction with Spec3D, is helping to determine the contributions of various physical processes to the observed spectroscopy and will help the project team to design and interpret future experiments at the NTF and DPF.
A journal article based on this work has been submitted to The Review of Scientific Instruments and is currently in the peer-review process.
Title: "Development of a spectroscopic technique for simultaneous magnetic field, electron density, and temperature measurements in ICF-relevant plasmas"
Authors: Eric Dutra[1], Jeffrey Koch[1], Aaron Covington[2], Radu Presura[1], Roberto Mancini[2], Timothy Darling[2], William Angermeier[2], and Showera Haque[2]. Author Affiliations: 1) National Securities Technologies, LLC, 2) Physics Department and Nevada Terawatt Facility, UNR.

2. Other Proposal Development

During Q1 2016, NCAR has formed a team of UNR faculties and a small company in Las Vegas to developed a $100,000 proposal submitted to the Nevada Homeland Security Program (HSGP). We have confirmation from the Division of Emergency Management & Office of Homeland Security in Carson City that the award will be issued in September 2016. The proposal focus in the development of a Nevada Cybersecurity Statewide Capacity Assessment Plan that will improve cybersecurity capacity of the state by coordinating effort, policy, systems and investment of resources across a continuum of data driven needs, according to identified gaps and best practices, benefiting state, local governments, private industry and Nevadan citizens in urban, rural and frontier counties.

3. Additional Accomplishments

Additional accomplishment listed below were not included in the scorecard due to lack precise metrics at the time this report was completed. However, we will survey these companies to determine potential KF metrics and report accordingly. As we progress with NCAR implementation, we will evaluate different mechanisms that can provide practical ways to track KF metrics from the different companies/groups that interact with us.

a. The following companies continue working at the Innevation Center:
   Captstak, Manzanita Labs, Elev8 Strategies, and Nevada Dynamics.
b. The startup Dringo continue being incubated at our facility for all their R&D activities. The company hires 2 UNR interns (programming & marketing).
c. The company Flitery, originally incubated at the Applied Research Facility, has expanded into a 9,000 sq. ft. facility off-campus.
d. The company DiscoveryDX renewed the lab and office lease at the Applied Research Facility for another year.
e. The company StrykaGen renewed the lab and office lease at the Applied research facility for another year.

4. Commercialization and Partnering Activities

A partnership with RTC, City of Reno and City of Sparks is being created for the Synchronize and Sustainable Mobility (Living Labs) project.

5. Programmatic and Project Changes

Evolutionary Computing System Lab. CS219 Computer Organization teaching in Spring 2016 semester is completed. We did not hear back from Gurobi about the clinic scheduling project and we did not hear back from Dr. Raul Rojas from the Mathematics department about autonomous vehicle project.

Nevada Terawatt Facility. The installation of the laser at the DPF has taken longer than originally estimated since it must meet stringent DOE laser safety requirements. Hence, experimental operation of the laser on the DPF floor has been delayed until August 2016.

6. Looking Forward

NCAR Management. During the next of 2016 quarter, NCAR will continue working on its basic infrastructures while defining and promoting its identity both within UNR and outreaching local and regional industry. For this we will continue our face-to-face-meetings with lab and colleges representatives, and increase our collaboration with NV Industry Excellence through our newly defined access of NCAR to NVIE database of customers. Stronger interaction with key UNR Labs will be established, including combined efforts to reach out and promote services with local and regional industries. NCAR will continue the development and implementation of the Synchronized and Sustainable Mobility program and the relationship with RTC and Fraunhofer Institute IVI. UNR's entrepreneurial transformation, the innovative views and support of the local and state authorities and the startup- and industry-friendly culture that exist in the region form the ideal components for this endeavor. By defining a systematic way to readily connect citizens, ideas, projects and resources to accelerate relationship, partnership and innovation; success for the Synchronized and Sustainable Mobility program would be defined by a clear economic a n d academic developmental expansion throughout the region, turning research into businesses and jobs, launching companies and negotiating master research agreements. During Q3, NCAR will prepare all necessary material to complete the award process for the Nevada Cyber Statewide Capacity and Needs Assessment Plan. We are expecting to initiate this project in October 2016.

Bioscience Entrepreneurial Lab. Main goal for the BEL is to increase the number of companies (tenants) using the lab and to include the lab into the iLab system. Second company is expected to be in the lab by Q3.

Laboratory Information Management System. During Q3-2016, we will identify a new set of Core Labs to be included in the LIMS while the pilot program continues. LIMS' advanced features will offer NCAR a needed shared platform to manage all SRFs and CLs allowing us to expose in a uniform display all available resources and services at the University.

High Performance Computing Facility. A survey will go out to all UNR researchers to ascertain needs for the HPC cluster to be acquired. A working group will produce a set of specifications in preparation for a request for proposals for the HPC system. Concurrently a working group is developing the governance model for operations for the HPC cluster.

Evolutionary Computing System Lab. The center will continue: a) working on the Traffic Signal Optimization project. Dr. Tian still has a strong need on the research and development of the optimization platform, b) teaching 2 courses at UNR for the next two semesters, c) working on the research of co-evolving micro behaviors for RTS games, and d) working on the research of RenoRescueSim. The center is also expecting a new project on a robotics related to Bridge Inspection with Dr. Hung La.

The Mick Hitchcok Nevada Proteomic Center. The center will will continue to provide cutting edge mass spectral approaches for proteomic researcher within NSHE. The education through workshops and seminars of our researchers on proteomic approaches is a primary

focus of the Proteomic Center. This education will not only generate more clientele for the center but it will enhance the proteomic research of the principal investigator making them more competitive in garnering research funding. The center will continue to pursue funding opportunities through both private donors and government agencies to provide NSHE proteomic researchers and industries cutting-edge instrumentation.

Autonomous Car Program. Resolved the vehicle platform issue encountered unexpected delays and this could be resolved during Q3 2016, which will include ordering all the necessary sensors and integrate them in the vehicle. We will continue developing the Living Lab Proposal and the next step will be to solidify the unified partnership with key stakeholders between the public authorities and UNR/NCAR to create an infrastructure that would encourage and facilitate the participation of citizens and industry (RTC, Proterra, City of Reno and City of Sparks). We anticipate that before the end of Q3 2016 we will complete Phase I (Governance, Planning and Agreements) and Phase II (Data Collection, Vehicles Instrumentations and Intelligent Transp. System Assessment). Additional Phases include Phase III (Data Mining, Communication and Algorithms Development) and Phase IV (Licenses, Commercialization and Policies)

Section II: Performance

1. Progress toward Metrics

Standard Knowledge Fund Metrics	Current Status / Target		
	By 09/30/15	By 12/31/15	By 06/30/17
Companies relocating to Nevada	0 / 0	0 / 0	0 / 1
Startup companies	0 / 0	0 / 0	0 / 1
Jobs created	0 / 4	2 / 4	3 / 5
Intellectual Property Licenses/Options Executed	0 / 0	0 / 0	0 / 1
Intellectual Property Revenue	$0 / $0	$0 / $0	$0 /$0
Grants Received	$51,581/$0 $0	$78,772/ $0	$106,987 / $0
Sponsored Research	14 / 18	16 / 19	18 / 62
Patents	0 / 0	0 / 0	0 / 2
Students placed with Companies	0 / 0	0 / 0	1 / 4
Impact Faculty Hired	1 / 1	0/ 1	1 / 7
Gifts/Donations to KF Projects	$1.2M / $0	$0/$0	$175K / $400K
Student Internships	0 / 0	0 / 0	1 / 5

2. Project Scorecard Narrative

1. Companies Relocating to Nevada

Autonomous Car. Once the project is fully implemented, we will negotiate with Autonomous GmbH to open an office in Reno.

2. Start-up Companies

NCAR Management. NCAR will incubate a startup company (EscaZyme Biochemicals) that will be working out of the Bioscience Entrepreneurial Lab.

3. Jobs Created

NCAR Management. Created 2 positions, the director of the center and the Share Research Facility Coordinator. A third position will be open by next quarter for a Director Research Communication
High Performance Computing Facility. Once implemented, it is expected that the HPCF will need to hire at least 1 expert for operation/maintenance.
Autonomous Car. Once the project is fully implemented, we anticipate at least 2 jobs being created.

4. Intellectual Property Licenses/Options Executed

Evolutionary Computing Systems Lab. We will initiate a license agreement with Office of Naval Research for the use of software developed by the lab.

5. Intellectual Property Revenue – Nothing to report at this time.

6. Grants Received

Evolutionary Computing Systems Lab. RenoRescueSim, Dr. David Feil-Seifer, Amount $6,447.19; Coevolving Micro Behaves for RTS Games, Dr. Sushil Louis, Amount $16,834.32; Traffic Optimization, Dr. Zong Tian, Amount $33,421.50; BioClarityAnalytics, Koya Noe, Amount $10,000; Teaching CS219 in the CS department at UNR, Amount: $7,935.00. Teaching CS105 in the CS department at UNR in Fall 2016 and Spring 2017, Amount: $15,870.00. Teaching CPE201 in the CS department at UNR in Fall 2016 and Spring 2017, Amount: $15,870.00

Proteomics Center. Federal and State funding in the amount of $14,631 was used at the Nevada Proteomic center by NSHE researchers.
Federal and State funding in the amount of $12,989 was used at the Nevada Proteomic center by NSHE researchers.

7. Sponsored Research

Evolutionary Computing Systems Lab. RenoRescueSim, Coevolving Micro Behaves, Traffic Optimization, BioClarityAnalytics.
Proteomics Center. Twelve NSHE researchers utilized the center for different sponsored research activities. It is expected about 10 of these research activities per quarter. These RO1 type of research are granted due to the center's capability to support Proteomics activities.
Autonomous Car. Once the project is fully implemented, we anticipate at least 1 sponsored research.
Nevada Terawatt Facility. NTF/NSTec Laser Plasma Diagnostics Development for the Dense Plasma Focus. NSTec has issued task orders for the design, construction and installation of the laser system.

Nevada Terawatt Facility. Development of Spectroscopic Plasma Diagnostics for Measurement of Electromagnetic Fields. NSTec has issued two task orders to cover aspects of this experiment to be conducted at NTF.

8. Patents

Nevada Terawatt Facility. NTF/NSTec Laser Plasma Diagnostics Development for the Dense Plasma Focus. No patents were applied for this cycle on this project. It is anticipated that unpublished and newly developed portions of the laser diagnostics system will be patented in Year 2.

Nevada Terawatt Facility. Development of Spectroscopic Plasma Diagnostics for Measurement of Electromagnetic Fields. During the course of this research program- we have developed a new technique to activate medical isotopes used in positron tomography emission (PET) scans. We are applying for provisional patents for these potentially transformative technologies.

9. Students placed with Companies

Nevada Terawatt Facility. Development of Spectroscopic Plasma Diagnostics for Measurement of Electromagnetic Fields. Four NTF graduate (PhD) students have had preliminary interviews with NSTec during the reporting period. Of these, two have travelled to company sites for further interviews and NSTec has extended job offers. The remaining NTF graduate students are still setting up site visits for full interviews.

10. Faculty Hired

Evolutionary Computing Systems Lab. Research Assistant Professor, Siming Liu

High Performance Computing Facility. Recruitment for a HPC system administrator will begin in July 2016.

Nevada Terawatt Facility. NTF/NSTec Laser Plasma Diagnostics Development for the Dense Plasma Focus. Research Professor (0.25 FTE- Year 1), Postdoctoral Research Scholar (0.5 FTE). Note: The Physics Departments is currently creating a long-term plan as part of our external academic accreditation/review process. This document includes requests for hiring several new impact faculty members that will leverage off of NTF/NSTec capabilities.

Nevada Terawatt Facility. Development of Spectroscopic Plasma Diagnostics for Measurement of Electromagnetic Fields. Research Professor (0.167 FTE- Year 1), Asst. Research Prof (0.1FTE)- Year 1 Postdoctoral Research Scholar (0.5 FTE). Note: The Physics Departments is currently creating a long-term plan as part of our external academic accreditation/review process. This document includes requests for hiring several new impact faculty members that will leverage off of NTF/NSTec capabilities.

11. Gifts/Donations to KF Projects

Nevada Terawatt Facility. NTF/NSTec Laser Plasma Diagnostics Development for the Dense Plasma Focus. NSTec has purchased a new state-of-the-art laser system for the project and will also be providing laser tables and other support equipment at the N. Las Vegas site. NSTec has given NTF students and researchers access to state-of-the-art plasma diagnostics systems during the reporting period. These diagnostics include two white light streak cameras and a 16 channel digital framing camera.

Nevada Terawatt Facility. Development of Spectroscopic Plasma Diagnostics for Measurement of Electromagnetic Fields. NSTec has purchased two state-of-the-art optical spectrometers to be used with this project as well as high-resolution gated CCD cameras. NSTec has given NTF students and

researchers access to other plasma diagnostics systems during the reporting period. These diagnostics include two white light streak cameras and a 16 channel digital framing camera.

Proteomics Center. $1.2 M was provided to the Nevada Proteomics Center by Mick Hitchcock for the enhancement of the center.

12. Student Internships

Autonomous Car. Once the project is fully implemented, we anticipate at least 2 student's internship working on the project.

Nevada Terawatt Facility. NTF/NSTec Laser Plasma Diagnostics Development for the Dense Plasma Focus. Four NTF graduate (PhD) students have had preliminary interviews with NSTec during the reporting period. Of these, two have travelled to company sites for further interviews and NSTec has extended job offers. The remaining NTF graduate students are still setting up site visits for full interviews.

Nevada Terawatt Facility. Development of Spectroscopic Plasma Diagnostics for Measurement of Electromagnetic Fields. Two undergraduate NTF workers have completed recent internships with NSTec. In addition, NSTec has made their facilities available to our graduate students who have used these to calibrate equipment needed for experiments at NTF.

Section III: Budget

NCAR: KNOWLEDGE FUND SUMMARY ROLLUP - PROJECT: Expenditures For Reporting Period April 1 – June 30, 2016			
	Estimate (Year 1)	Expenditures Inception to Date Jul 1, 2015 - Jun 30, 2016	**Expenditures** Current Period Apr 1 - Jun 30, 2016
Total Salary & Benefits	$ 1,259,825	$ 328,424	$ 131,078
Equipment	$ 933,977	$ 128,141	$ 55,782
Travel	$ 91,847	$ 8,095	$ 7,090
Other Direct Costs	$ 797,130	$ 36,253	$ 11,768
Graduate Tuition	$ 25,720	$ 1,571	$ -
Total	**$ 3,108,500**	**$ 502,484**	**$ 205,718**

NCAR: KNOWLEDGE FUND SUMMARY ROLLUP - PROJECT: Funds For Reporting Period April 1 – June 30, 2016			
	Estimate (Year 1)	Funds Inception to Date Jul 1, 2015 - Jun 30, 2016	Funds Current Period Apr 1 - Jun 30, 2016
Grants / Contracts*	$ 0.00	$ 160,462	$ 59,877
Gifts	$ 0.00	$ 1,375,000	$ -
Cont. ED/ Outreach	$ -	$ -	$ -
Other Contributions*	$ -	$ 400,000	$ -
Knowledge Fund	$ 3,108,500	$ 296,765.57	$ 193,813.66
Total	**$ 3,108,500**		

Section IV: Monthly Logs of NCAR Programs Activities for Reporting Quarter

N/A

Section V: Appendices

Appendix 1 – Sales Pipeline

Company Name	Company Type	Opportunity Type	Notes (Progression and Next Step)
Prospects - Interest (3 - 5)			
Dream Jay	Sleep Science	Fee-for-service/collaboration	Discussion in early stages. Needs will be defined during Q3.
OldEKG.com	EKG/Medical Tech.	Fee-for-service/collaboration	Discussion in early stages. Needs will be defined during Q3.
The Safety Training of Nevada, LLC	Driving Safety	Fee-for-Service / Collaboration	This is a brand-new startup. They just got seed-funded and we are discussing possibility of using IC or ARF spaces for their training program, as well as developing a system that will integrate different simulators and eye-trackers.
Switch	Data Center	Collaboration	Installation of the HPC in their facility.
Proterra	Electric Bus	Collaboration	To be defined their role and participation in the Synchronized and Sustainable Mobility program.

Qualified - Desire (5 - 5)			
Ford Motor Company	Research & Innovation Center – Palo Alto	Autonomous Vehicles	We had a good meeting at their research facility. Although they have responded with great interest, they still did not respond to what extent they want to participate in our projects or collaborate with UNR.
Tribal Rides, LLC	Transportation Networking	Fee-for-Service/Collaboration	Startup Co. has developed patent pending intellectual property in the deployment of autonomous vehicles. Looking for a partnership to collaborate in additional developments. The company is still looking for fundings.
Haws Corporation	Manufacturing	Fee-for-service	Efficient method to treat (eliminate) Legionella in water. Looking for a project lead at UNR. Company is not responding to this project and may take longer for them to define the scope.
Haws Corporation	Manufacturing	Fee-for-Service	Still waiting for the marketing department to send a definition and scope of their proposal.
Chowdhury	Louisiana State University	LC/MS	Need to decide on scope of work for Proteomics.
LF Research	EMC Design/Testing	Lease one of our Labs / Partner with UNR Through NCAR	MOU being developed.
Negotiation - Action (4 - 5)			
Nevada Nanotech Systems	Manufacturing micro-electro-mechanical systems.	Fee-for-use of Lab & Equipment	Agreement completed and proof of insurance on file. Waiting for company to develop final scope of work and sign agreement.

Florida Atlantic University	Education/Research	Fee-for-service	A $10,000 agreement was signed by FAU. However, some terms in the addendum still being reviewed by the legal parties at UNR and FAU.
EscaZyme Biochemicals	Chemical products	Fee-for-use of Lab & Equipment	An agreement was drafted to use NCARS Bioscience Entrepreneurial Lab. Waiting for final price structure approval.
University of Alaska Anchorage	Higher Education	Fee-for-service	If there are desirable results from current project, 2nd analysis will be run.
Biofilm Management Inc	Chemical Engineering	Fee-for-Service / Lease BEL	This company is interested in using some of the chemical instruments and microscopes in the SRFs and Lease BEL. Agreements being prepared, expected to close in Q3.
Tesla Motors	Cars/Batteries	Master Fee-for-Service	Company is interested in a master fee-for-service agreement that can be extended across multiple labs on campus.
Won or Lost (7 - 8)			
Dynamic Certification Laboratories	Engineering Services	Fee-for-service	**WON:** An agreement for $22,500 was signed. Project to be executed in July 2016
Dynamic Isolation System	Engineering Services	Fee-for-service	**WON:** An agreement for $5,200 was signed.
Portland State University	Education/Research	Fee-for-service	**WON:** An agreement for $28,000 was sent for signature for services scheduled for June 2016.

BioClarityAnalytics	Startup	Collaboration	**WON:** Job Completed. Discussions on new potential collaborations to follow.
Reno Transportation Center	Transportation	Collaboration	**WON:** Job Completed. Discussions on new potential collaborations to follow.
Olea Systems Inc	Tracking	Fee-for-Service	**WON:** Work agreement for $8,597.28 completed.
Trans Intelligence, Inc	Transportation	Fee-for-Service	**WON:** Work agreement for $15,000.00 completed.
EscaZyme	Biochem.	BEL Lease	**WON:** A 6-month lease was paid in full ($600). Expected to renew for another 6 months.
Tesla Motors	Cars/Batteries	Fee-for-Service	**WON:** Work agreement for $500 completed. Larger agreement expected to follow.
PetSmart, Reno	Distribution Warehouse	Collaboration	**LOST:** Due to lack of infrastructure at UNR to satisfy the basic requirements for this project. (Expressed interest in using some of the labs and instruments for collaborative development for their Fish Operation and Health section DC42).
Haws Corporation	Manufacturing	Fee-for-use of lab/equipment	**LOST:** Due to lack of necessary equipment at UNR (VARIAC to test instantaneous heater prototype.
Gorubi	Leading Co. in optimization	Collaboration	**LOST:** Company did not agree with development prices.